VITROS Products Immunodiagnostic

# INSTRUCTIONS FOR USE

# HBCon

**VITROS Immunodiagnostic Products**
**HBsAg Confirmatory Kit**

REF 680 1324

**CAUTION:** **Federal law restricts this device to sale by or on the order of a physician.**

## Intended Use

For the qualitative confirmation of hepatitis B surface antigen (HBsAg) in human serum and plasma specimens (heparin, EDTA, and sodium citrate) that have been found to be repeatedly reactive using the VITROS Immunodiagnostic Products HBsAg Reagent Pack and the VITROS Immunodiagnostic Products HBsAg Calibrator with the VITROS ECi/ECiQ Immunodiagnostic System.

**WARNING:** ***This assay has not been FDA cleared or approved for the screening of blood or plasma donors.***
***Assay performance characteristics have not been established when the* VITROS *HBsAg Confirmatory Kit is used in conjunction with other manufacturers' assays for specific HBV serological markers. Users are responsible for establishing their own performance characteristics.***

## Summary and Explanation of the Assay

The presence of HBsAg in samples found to be repeatedly reactive in the VITROS HBsAg assay may be confirmed by a neutralization reaction using human antibody to HBsAg (anti-HBs).

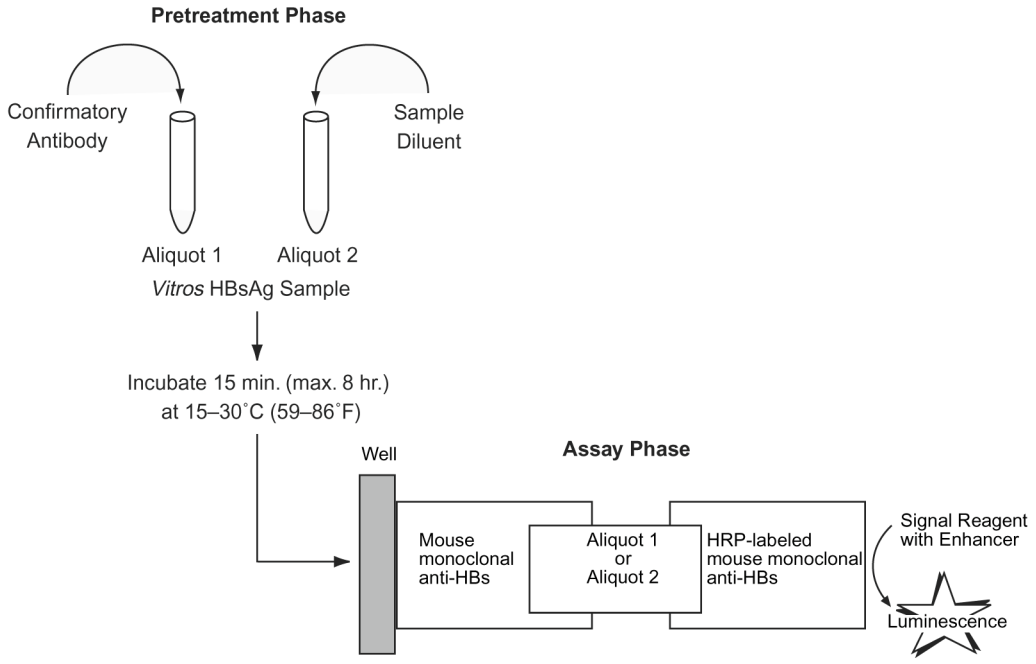
A sample that can be neutralized is considered positive for HBsAg.

## Principles of the Procedure

The VITROS HBsAg Confirmatory Kit uses the principle of specific antibody neutralization to confirm the presence of HBsAg. The sample is tested twice: one aliquot is incubated with a neutralizing reagent containing high titer anti-HBs (the Confirmatory Antibody); the second aliquot is incubated with a non-neutralizing control reagent (the Sample Diluent). The Confirmatory Antibody binds to HBsAg in the sample inhibiting its reaction in the VITROS HBsAg assay. This leads to a reduced result compared to that for the non-neutralized control sample. Refer to the VITROS HBsAg Reagent Pack instructions for use for a description of the principles of that assay.

| Assay Type | Assay Time and Temperature | |
|---|---|---|
| Specific antibody neutralization | Incubation time | 29 minutes |
| | Time to first result: | 37 minutes |
| | Temperature | 37 °C |

***Reaction Scheme***




## Warnings and Precautions

For in vitro diagnostic use only.

**WARNING: Potentially Infectious Material**

***Human blood products provided as components of this pack have been obtained from donors who were tested individually and found to be negative for HBsAg, and for antibodies to human immunodeficiency virus (HIV 1+2) and hepatitis C virus (HCV), using FDA approved methods (enzyme immunoassays, EIA). The VITROS HBsAg Calibrator contains human HBsAg purified from donors who were tested individually and found to be negative for antibodies to HIV 1+2 and HCV (using EIA). The purified HBsAg has been heat inactivated (10 hours at 60 °C). Treat as if capable of transmitting infection***

***Care should be taken when handling material of human origin. All samples should be considered potentially infectious. No test method can offer complete assurance that hepatitis B virus, HCV, HIV 1+2 or other infectious agents are absent. Handling of samples and assay components, their use, storage and solid and liquid waste disposal should be done at a biological safety level 2 and be in accordance with the procedures defined by the appropriate national biohazard safety guideline or regulation.***[1,2]

**WARNING: Contains Kathon**

***The reagents contain Kathon. R43: May cause sensitization by skin contact. R52/53: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. S24: Avoid contact with skin. S37: Wear suitable gloves.***

## Reagents

### Kit Contents

One VITROS HBsAg Confirmatory Kit (CAT No. 680 1324) contains:

- 2 vials of freeze-dried Confirmatory Antibody reagent (anti-HBs positive human serum) with antimicrobial agent (1%Kathon w/v). Each binds ≥1 µg HBsAg. Reconstitution volume is 1.5 mL.
- 2 bottles (each 27 mL) of Sample Diluent (human serum, non-reactive for HBsAg, anti-HBs negative) with antimicrobial agent (0.5% bronidox w/v).
- Protocol card for the VITROS HBsAg Confirmatory Kit.

### Kit Handling

- The Confirmatory Antibody reagent is supplied freeze-dried.
- The Sample Diluent is supplied ready for use.

### Kit Stability

When stored and handled as specified in the package labeling, the VITROS HBsAg Confirmatory Kit is suitable for use until the expiration date printed on the outside of the carton.

### Kit Storage and Preparation

- Store the unopened kit components refrigerated at 2–8 °C (36–46 °F). Do not freeze.
- Reconstitute the Confirmatory Antibody with 1.5 mL distilled water and mix by inversion. After reconstitution, store refrigerated for up to 8 weeks at 2–8 °C (36–46 °F), or frozen for up to 12 weeks at -20° C (-4 °F), with no more than one freeze-thaw cycle.
- After opening the Sample Diluent, store refrigerated for up to 12 weeks at 2–8 °C (36–46 °F), or frozen for up to 12 weeks at –20 °C (-4 °F), with no more than one freeze-thaw cycle.
- Mix the reconstituted Confirmatory Antibody and Sample Diluent by inversion and bring to 15–30 °C (59–86 °F) before use.

## Specimen Collection and Preparation

### Patient Preparation

No special patient preparation is necessary.

### Recommended Specimen Types

Serum, EDTA, heparin, or citrated plasma.

### Specimens Not Recommended

Turbidity in samples may affect assay results.

### Special Precautions

Some sample collection devices have been reported to be detrimental to the integrity of certain analytes, and could interfere with some method technologies. [3] Because of the variety of sample collection devices available, it is not possible to issue a definitive statement on the performance of VITROS Immunodiagnostic Products when used with these devices. Each user should confirm that the chosen device is used according to the manufacturer's instructions and is compatible with this assay.

### Specimen Collection and Preparation

- Collect specimens using standard procedures.[4]
- The VITROS HBsAg Confirmatory Kit uses a minimum of 400 µL of sample for each determination (200 µL each for the neutralized and non-neutralized test).
- For details on minimum fill volume of sample cups or containers, refer to the VITROS ECi/ECiQ Immunodiagnostic System Operator's Guide.
- Samples should be thoroughly separated from all cellular material.

### Handling and Storage Conditions

- Handle specimens in stoppered containers to avoid cross-contamination and evaporation. Use a separate disposable tip if samples are manually pipetted. Avoid splashing, forming an aerosol, or cross-contaminating sample tube stoppers.
- The amount of time samples are on board the system prior to analysis should be limited to avoid evaporation. This time should not exceed two hours. Refer to the VITROS ECi/ECiQ Immunodiagnostic System Operator's Guide for further information.
- The Clinical and Laboratory Standards Institute (CLSI), [formerly the National Committee for Clinical Laboratory Standards (NCCLS)] provides the following recommendations for storing specimens: [5]
  - Store samples at 22°C (72°F) for no longer than 8 hours.
  - If the assay will not be completed within 8 hours, refrigerate the sample at 2–8°C (36–46°F).
  - If the assay will not be completed within 48 hours, or for shipment of samples, freeze at or below -20 °C (-4°F).
- Samples are not to be repeatedly frozen and thawed because this can cause analyte deterioration. Samples are to be thawed only once.

## Neutralization Procedure

The neutralization assay is carried out manually, off-board the system.

Samples with a result >500 signal/cutoff (s/c) in the VITROS HBsAg assay should be diluted 1 in 151 in Sample Diluent. To dilute sample, add 1.5 mL Sample Diluent to 10µL of sample. Samples with a result ≤500 s/c in the VITROS HBsAg assay should be tested without dilution.

The volume of the sample neutralized may be varied. A minimum volume of 200 µL should be used and the ratio of sample: Confirmatory Antibody (or Sample Diluent) must remain constant at 4:1.

1. Take two 200 µL aliquots of HBsAg positive control (C1), or sample (or diluted sample) which is repeatedly reactive for HBsAg and which requires confirmation, and add one aliquot to each of two sample containers, e.g. VITROS sample cups.
2. Add 50 µL (i.e. 0.25 x sample volume) of Confirmatory Antibody to one aliquot. Add 50 µL (i.e. 0.25 x sample volume) of Sample Diluent to the other aliquot.
3. The VITROS HBsAg Confirmatory Kit requires a minimum of 400 µL sample or control for each determination (200 µL each for the neutralized and non-neutralized test). This does not take into account the minimum fill volume of the chosen sample container.
4. Incubate for at least 15 minutes at 15–30°C (59–86°F), up to a maximum of 8 hours [including 2 hours on board the VITROS ECi/ECiQ Immunodiagnostic System (VITROS Immunodiagnostic System)]. If the total incubation time (including on board storage) is to exceed 2 hours, sample containers should be capped to minimize evaporation. If necessary, transfer to a sample cup or container compatible with the VITROS Immunodiagnostic System. Refer to the VITROS ECi/ECiQ Immunodiagnostic System Operators Guide, Section 6, Preparing Samples for details of preparation and treatment of samples.
5. Process samples selecting the HBCon assay button from the Sample Programming screen on the VITROS Immunodiagnostic System. See VITROS HBsAg Reagent Pack instructions for use for details of VITROS HBsAg assay calibration.
6. In sample programming, give unique ID's to the neutralized and non-neutralized samples submitted for confirmation to allow clear differentiation on laboratory reports from the previously reactive HBsAg test results.

## Assay Procedure

### Materials Required But Not Provided

The following items are required for use with the VITROS HBsAg Confirmatory Kit:

- VITROS Immunodiagnostic System
- VITROS HBsAg Reagent Pack
- VITROS HBsAg Calibrator
- VITROS Immunodiagnostic Products Signal Reagent
- VITROS Immunodiagnostic Products Universal Wash Reagent
- VITROS Immunodiagnostic Products HBsAg Controls
- VITROS Immunodiagnostic Products Reagent Pack Storage Box (optional) with desiccant
- Pipettes
- Distilled water

### Operating Instructions

Refer to the VITROS ECi/ECiQ Immunodiagnostic System Operator's Guide for complete instructions on the operation of your VITROS Immunodiagnostic System.

## Calibration

### Required Calibrators

VITROS HBsAg Calibrator

### Calibrator Preparation, Handling, and Storage

Refer to the calibrator instructions for use for information on the use of VITROS HBsAg Calibrator.

### Calibration Procedure

The VITROS HBsAg Confirmatory Kit requires that a valid calibration for the VITROS HBsAg assay be available on the VITROS Immunodiagnostic System prior to performing this assay.

Refer to the VITROS HBsAg Reagent Pack and Calibrator instructions for use for information on establishing a valid calibration.

### When to Calibrate

- Calibrate when the lot of VITROS HBsAg Reagent Pack and Calibrator changes
- Calibrate every 28 days

The VITROS HBsAg assay may also need to be calibrated:

- After specified service procedures have been performed (see the VITROS ECi/ECiQ Immunodiagnostic System Operator's Guide)
- If quality control results are consistently outside of the manufacturer's or your acceptable range

For additional information on when to calibrate, refer to the VITROS ECi/ECiQ Immunodiagnostic System Operator's Guide.

## Quality Control

### Procedure Recommendations

- Choose control levels that check performance at clinically relevant points. The recommendation is to run a positive control close to the HBsAg decision point (signal/cutoff ≥ 1.00).
- The VITROS HBsAg positive control or equivalent control material should be tested with the VITROS HBsAg Confirmatory Kit as neutralized and non-neutralized sample in the same manner as patient specimens.
- The VITROS HBsAg positive control should show ≥80% neutralization.
- Controls should be processed with each HBsAg Confirmatory run.
- Refer to the VITROS HBsAg Reagent Pack and Calibrator instructions for use for details of quality control of the VITROS HBsAg assay.
- If control results fall outside the stated range or outside your established acceptable range, patient results should not be reported. Investigate and determine the cause for the unacceptable control results. When the condition is corrected, retest the controls and confirm that results are within acceptable limits. It is advisable to repeat some or all patient specimens before reporting results for this run.
- For more detailed information on quality control procedures, refer to the VITROS ECi/ECiQ Immunodiagnostic System Operator's Guide.
- Refer to *Internal Quality Control Testing: Principles and Definitions* or other published guidelines for general quality control recommendations. [6]
- Additional controls may be tested according to guidelines or requirements of local, state, and/or federal regulations or accrediting organizations.

### Quality Control Material Selection

Choose control material that has a composition similar to or identical with the patient sample matrix being analyzed. [7]

VITROS HBsAg Controls are recommended for use with the VITROS Immunodiagnostic System. The performance of other commercial control fluids should be evaluated for compatibility with this assay before they are used for quality control.

Appropriate quality control value ranges should be established for all commercially available quality control materials used with the VITROS HBsAg assay.

### Quality Control Material Preparation and Storage

Refer to the manufacturer's product literature for preparation, storage, and stability information.

## Interpretation of Results and Expected Results

Results will be generated for the non-neutralized and neutralized samples.

To determine the % neutralization, make the following calculation:

$$\% \text{ Neutralization} = \frac{(\text{result A} - \text{result B}) \times 100\%}{\text{result A}}$$

Where: A = non-neutralized result (s/c)

B = neutralized result (s/c)

| | |
|---|---|
| **NOTE:** | In the VITROS HBsAg Confirmatory Kit, the neutralized and non-neutralized results are used for the calculation of the % neutralization. |
| | A Testing Algorithm Flow Chart to aid in the interpretation of results is available at the end of this section. |

The cutoff value for positive results in the VITROS HBsAg Confirmatory Kit is set at 0.80 s/c. Samples are diluted by 20% in the Confirmatory Kit by the addition of the Confirmatory Antibody (neutralized) or Sample Diluent (non-neutralized). A sample which has an initial result in the VITROS HBsAg assay at the cutoff value of 1.00 s/c (result classification "reactive") would therefore have a result of 0.80 s/c when re-assayed in the VITROS HBsAg Confirmatory Kit.

A sample is considered confirmed if the result of the non-neutralized sample is ≥0.80 s/c **and** the % neutralization is ≥50% (see Table 1). A sample that is repeatedly reactive in the VITROS HBsAg assay, and which is confirmed in the VITROS HBsAg Confirmatory Kit, is considered positive for HBsAg.

**Table 1. Interpretation of initial results prior to any re-test or dilution.**

| All samples | | |
|---|---|---|
| **Non-neutralized result (s/c)** | **% Neutralization** | **Confirmatory Test Result Classification or Action to be taken** |
| ≥0.80 | ≥50% | Confirmed (HBsAg positive) |
| ≥0.80 | <50% | Dilute further and retest |
| <0.80 | Any value | Retest |

If the result of the non-neutralized sample is <0.80 s/c the sample should be retested with the VITROS HBsAg Confirmatory Kit.

If the repeat result of the non-neutralized sample is <0.80 s/c and:

- the % neutralization is <50%, the sample is not confirmed and is negative for HBsAg (see Table 2).
- the % neutralization is ≥50%, the HBsAg status of the sample is indeterminate. It is recommended that follow-up testing is performed (see Table 2).

Samples for which the result of the non-neutralized sample is ≥0.80 s/c and the % neutralization is <50% should be diluted in sample diluent to 1 in 151 and retested.

For samples which have been diluted, irrespective of the % neutralization, if the result of the non-neutralized sample is < 0.8, disregard the dilution and interpret on the undiluted results using Table 2.

For samples which have been diluted, if the result of the non-neutralized sample is ≥0.80 s/c **and** the % neutralization is ≥50% the sample is confirmed and is positive for HBsAg (see Table 2).

For samples which have been diluted and for which the % neutralization is <50% the following interpretations are made:

- If the result of the non-neutralized sample is >100 s/c, even when assayed diluted 1 in 151, the sample is likely to contain high levels of HBsAg and should be further diluted in sample diluent to 1 in 1500 or more and retested. Interpret results of any further dilutions using Table 2.
- If the result of the non-neutralized sample is ≥0.8 - ≤100 s/c, the sample is considered negative for HBsAg (see Table 2).

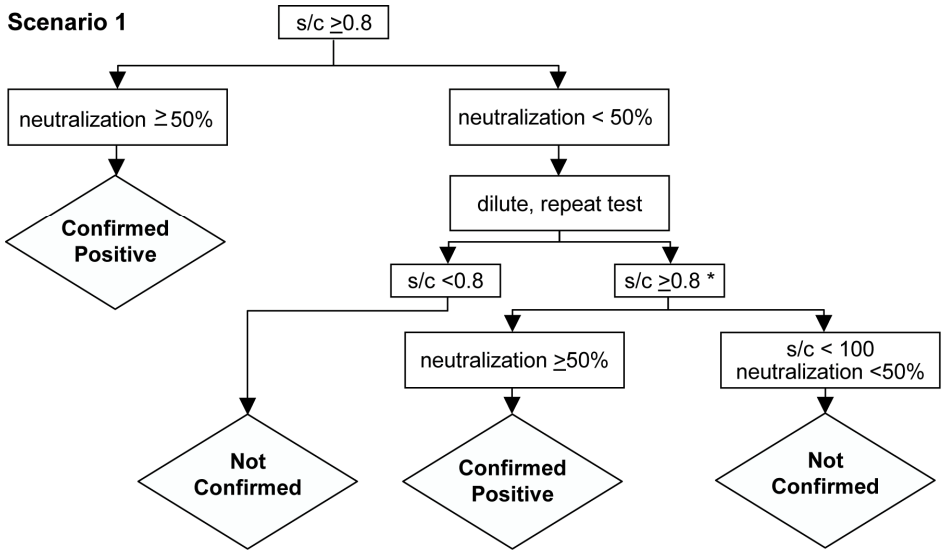
**Table 2. Interpretation of results after re-test or following dilution (see text)**

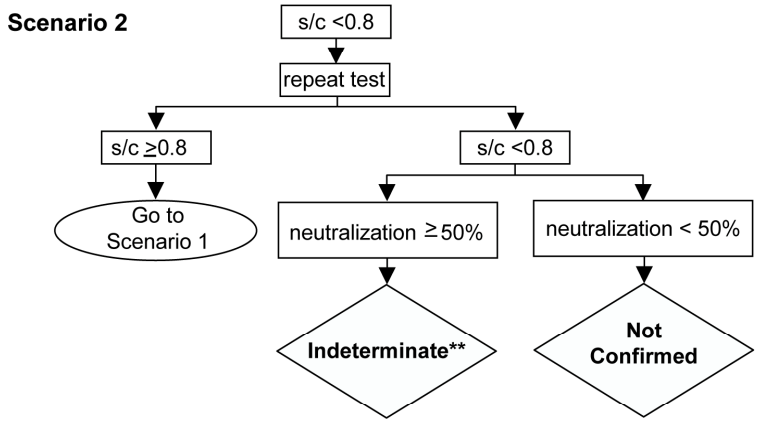
| Samples after dilution and/or retest | | |
|---|---|---|
| **Non-neutralized result (s/c)** | **% Neutralization** | **Confirmatory Test Result Classification or Action to be taken** |
| <0.80 | <50% | Not confirmed (HBsAg negative) |
| <0.80 | ≥50% | Indeterminate* |
| ≥0.80 | ≥50% | Confirmed (HBsAg positive) |
| >100 | <50% | Dilute further and retest |
| ≥0.8 to ≤100 | <50% | Not confirmed (HBsAg negative) |

- Follow-up testing is recommended. Does not apply to diluted samples.

Final results should be manually interpreted using the algorithm below.

## Testing Algorithm




s/c = result of signal/cut-off for the non-neutralized sample
* If the non-neutralized result after dilution is >100, dilute further to 1:1500 or more and re-test, until a value of ≤ 100 is achieved
** Follow up testing is recommended

## Limitations of the Procedure

- Heterophilic, e.g. human anti-mouse, antibodies in the serum or plasma of certain individuals are known to cause interference with immunoassays.[8] These antibodies may be present in blood samples from individuals regularly exposed to animals or who have been treated with animal serum products.
- Individuals recently vaccinated for hepatitis B may give a transient positive result for HBsAg because of its presence in the vaccine. [9]
- HBsAg results should only be used and interpreted in the context of the overall clinical picture. A negative or false reactive test result does not exclude the possibility of exposure to or infection with hepatitis B virus. Levels of HBsAg may be undetectable both in early infection and late after infection. In rare cases HBsAg tests do not detect certain HBV mutant strains.[10]

## Performance Characteristics

### VITROS HBsAg Confirmatory Kit Performance Among Known HBsAg Reference Assay Positive Samples from Various Sources

The VITROS HBsAg Confirmatory Kit was evaluated using reference HBsAg positive samples from various sources. All samples were reactive by the reference HBsAg assay and confirmed positive by neutralization using the reference HBsAg confirmatory kit.

The performance of the VITROS HBsAg Confirmatory Kit was evaluated among three groups of samples:

- Prospectively collected samples from individuals with signs or symptoms of hepatitis or who are at high risk for HBV infection.
- Archived commercial samples historically HBsAg reactive by the reference HBsAg assay and confirmed by neutralization using the reference HBsAg confirmatory kit.
- HBsAg positive samples from pregnant women, archived samples from dialysis patients, and archived samples from acute or chronic HBV infections.

The following two tables summarize the performance of the VITROS HBsAg Confirmatory Kit on samples from the prospective population where VITROS HBsAg results were repeatedly reactive (s/c ≥ 1.00 and ≤5.00) or HBsAg positive (s/c >5.00).

**VITROS HBsAg Confirmatory Testing in Repeatedly Reactive Samples with Two of Three Initial and Repeat VITROS HBsAg S/C Results ≥1.00 and ≤5.00**

| | Final Reference HBsAg Assay Result* | | | | |
|---|---|---|---|---|---|
| | + | | –** | | |
| | VITROS HBsAg Confirmatory Result | | | | |
| **Disease Classification** | **+** | **NT*** ** | **+** | **–** | **Total** |
| Acute Infection | 0 | 1 | 0 | 0 | 1 |
| Chronic Infection | 1 | 0 | 0 | 0 | 1 |
| Early Recovery | 0 | 0 | 0 | 1 | 1 |
| Not Previously Infected with HBV | 0 | 0 | 2 | 1 | 3 |
| **Grand Total** | **1** | **1** | **2** | **2** | **6** |

* Final reference HBsAg assay result is based on the initial test result, and confirmatory testing of repeatedly reactive samples.

** Reference HBsAg initial screening was negative; confirmatory testing was not performed.

*** Specimen was repeatedly reactive with the VITROS HBsAg assay; VITROS HBsAg confirmatory testing was not performed.

| VITROS HBsAg Confirmatory Testing in Samples with an Initial or Two of Three Repeat VITROS HBsAg S/C Results >5.00 | | | | |
|---|---|---|---|---|
| | Final Reference HBsAg Assay Result* | | | |
| | + | –** | | |
| | VITROS HBsAg Confirmatory Result | | | |
| Disease Classification | + | + | – | Total |
| Acute Infection | 3 | 0 | 0 | 3 |
| Chronic Infection | 2 | 0 | 0 | 2 |
| Uninterpretable | 1 | 0 | 0 | 1 |
| Not Previously Infected with HBV | 0 | 1 | 1 | 2 |
| **Grand Total** | **6** | **1** | **1** | **8** |

* Final reference HBsAg assay result is based on the initial test result, and confirmatory testing of repeatedly reactive samples.

** Reference HBsAg initial screening was negative; confirmatory testing was not performed.

The table below summarizes the samples evaluated from all sources (prospective and archived) using the VITROS HBsAg Confirmatory Kit. An HBsAg positive result by neutralization was obtained in 82 of 82 (100%) samples using the VITROS HBsAg Confirmatory Kit on HBsAg reference assay reactive and confirmed positive samples.

| Sample Sources | N | Reference HBsAg Reactive and Confirmed Positive by Neutralization | VITROS HBsAg Confirmatory Kit Confirmed Positive by Neutralization |
|---|---|---|---|
| Individuals with signs or symptoms of hepatitis or at high risk for HBV infection | 7 | 7 | 7 |
| Known HBsAg positive archived samples | 48 | 48 | 48 |
| Individuals with early acute infection | 21 | 21 | 21 |
| Individuals with clinically diagnosed chronic infection | 1 | 1 | 1 |
| Pregnant women | 5 | 5 | 5 |
| **Total** | **82** | **82** | **82 (100%)** |

The table below summarizes the distribution of VITROS HBsAg results and corresponding VITROS HBsAg Confirmatory Kit results among the combined 82 samples obtained from the various sources listed above.

| VITROS HBsAg Assay Result (s/c) | N | Number (%) Confirmed in the VITROS HBsAg Confirmatory Kit |
|---|---|---|
| ≥0.90 and <5.00 | 11 | 11 (100) |
| ≥5.00 and <10.0 | 6 | 6 (100) |
| ≥10.0 and <20.0 | 10 | 10 (100) |
| ≥20.0 and <100 | 14 | 14 (100) |
| ≥100 and <500 | 9 | 9 (100) |
| ≥500 | 32 | 32 (100) |
| **Total** | **82** | **82 (100)** |

A total of 10 cord blood samples and 10 adult serum samples spiked with HBsAg were neutralized by the VITROS HBsAg Confirmatory Kit.

### Substances that do not Interfere

As recommended by NCCLS Protocol EP7,[11] the VITROS HBsAg Confirmatory Kit was evaluated for interference by testing the following substances. Testing was performed using two lots of reagent. None of the levels tested were found to interfere with the clinical interpretation of the assay.

| Compound | Compound Concentration | |
|---|---|---|
| **Bilirubin** | 0.35 mmol/L | 20 mg/dL |
| **Hemoglobin** | 0.31 mmol/L | 500 mg/dL |
| **Triolein** | 33.9 mmol/L | 3000 mg/dL |

## References

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## Glossary of Symbols

The following symbols may have been used in the labeling of this product.

| | | | | | |
|---|---|---|---|---|---|
| | Do Not Reuse | EC REP | Authorized Representative in the European Community | C | Corrosive |
| | Use by or Expiration Date (Year-Month-Day) | Σ n | Contains Sufficient for "n" Tests | F | Flammable |
| LOT | Lot Number | | Upper Limit of Temperature | | Fragile, Handle with Care |
| SN | Serial Number | | Lower Limit of Temperature | | Keep Dry |
| REF | Catalog Number or Product Code | | Temperature Limitation | | This end up |
| | Attention: See Instructions for Use | n | Consult Instructions for Use, "n" Version | | Der Grüne Punkt (the Green Dot). Manufacturer follows certain packaging material waste disposal management regulations |
| | Manufacturer | Xi | Irritant | | |
| IVD | *In vitro* Diagnostic Medical Device | Xn | Harmful | | |

## Revision History

| Date of Revision | Version | Description of Technical Changes* |
|---|---|---|
| 2006-07-26 | 3.0 | • Changed all occurrences of "VITROS ECi System Operator's Guide" to "VITROS ECi/ECiQ Immunodiagnostic System Operator's Guide".<br>• Changed all occurrences of "VITROS ECi System" to "VITROS Immunodiagnostic System"<br>• *Intended Use- Warning:* Removed "Assay performance characteristics have not been established for testing of newborns."<br>• *Warnings and Precautions*: Added the Kathon warning<br>• *Performance Characteristics:* Added reference to neutralization of spiked cord blood and adult serum samples.<br>• *References:* Updated reference 2,4 and 11.<br>• *Glossary Of Symbols:* Updated table |
| 2004-03-30 | 2.0 | • *Interpretation of Results* – Revised text and added algorithm for clarification.<br>• *Glossary of Symbols* – Added table. |
| 2002FEB28 | 1.0 | • New format, technically equivalent to 2001APR12. |

* The change bars indicate the position of a technical amendment to the text with respect to the previous version of the document.

When this Instructions For Use is replaced, sign and date below and retain as specified by local regulations or laboratory policies, as appropriate.

_____ _____
Signature Obsolete Date

Conditions of supply: all supplies are made subject to the standard terms and conditions of Ortho-Clinical Diagnostics or its distributors. Copies of these are available on request.

**Co-developed with**

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